



Applications of Telemedicine in Tackling Infectious Disease Outbreaks: The Nigerian Perspective

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Dear editor,

In the context of healthcare delivery, the role of effective and timely medical attention cannot be overemphasized. In a bid to improve the speed and efficacy of healthcare delivery, the prospects and applications of telemedicine are quickly gaining ground globally. The word telemedicine precisely means “healing at a distance” (1), but in reality, it involves the use of technological devices to provide healthcare services and information over a distance to promote access and curtail costs. It has become an increasingly cost-effective and quicker alternative to the conventional face-to-face treatment used in hospitals and healthcare centers (1). With the advent of the COVID-19 pandemic, social distancing measures are widely implemented to stall disease transmission, with a downside being the impediment or complete cessation of the provision of certain healthcare services, such as maternal and child health services, mental health services, and a number of others (2). This has stressed the need for nations to explore telemedicine as an important tool in healthcare delivery, especially during disease outbreaks. In this article, we explore three major areas where telemedicine can be applied for quicker and more effective response to disease outbreaks in Nigeria.

Contact Tracing

One efficient strategy to curb the transmission of COVID-19 and other diseases in recent times is the tracing of primary and secondary contacts of confirmed cases. The traditional contact tracing strategy employed by the Nigeria Centers for Disease Control (NCDC) for COVID-19 and previous epidemics has been befuddled with a number of challenges, especially logistical difficulties and the stigma

associated with COVID-19, making contact tracing difficult and time-consuming. There is a need to develop new strategies, specifically digitally-integrated, to facilitate a more comprehensive, accurate, and timely response for contact tracing. Recently, various countries are utilizing digital tracing to improve their disease outbreak response efforts. An example is the method employed by Sierra-Leone during the 2014 Ebola outbreak in Africa, where a mobile app called Ebola Contact Tracing (ECT) was used to remotely trace reported cases of Ebola Virus disease. When compared with a paper-based format, the data collected by the ECT app was quicker and more reliable as it could accurately track a large number of contacts (3). With the penetration rate of mobile technology in Nigeria quickly rising beyond 50% (4), innovative methods such as the use of mobile positioning data can be employed in contact tracing. Collaborations between the government and mobile network operators (MNOs) can be leveraged in this regard; however, data privacy concerns need to be properly addressed before deploying such technology (5).

Continuation of Essential Healthcare Services

Infectious disease outbreaks like COVID-19 are known to create a deficit of healthcare services for patients with other health conditions that are not related to that of the outbreak. The 2014 Ebola outbreak in West Africa devastated the healthcare systems of Liberia, Guinea, and Sierra Leone, resulting in a reduction of access to healthcare services for Malaria, HIV/AIDS, and Tuberculosis, which are the major diseases endemic to the region (6). This resulted in as many as 10,000 additional deaths from these diseases, which would normally have been prevented if equal attention was paid to such diseases (6). In Nigeria, Malaria is a major public health issue and accounts for more cases and

deaths than any other country in the world. As healthcare efforts are devoted to the COVID-19 response, the malaria mortality rate keeps increasing and could even exceed the number of deaths from COVID-19 in Sub-Saharan Africa. Diseases like Malaria and other infectious diseases must not be overlooked, and affected patients should continue receiving regular care while maintaining social distancing measures. Telemedical approaches such as phone and video conference calls can be employed regularly in Nigeria to keep in touch with outpatients, and only severely ill patients need to be brought to the hospital. This will prevent the health system from getting overwhelmed and will also enhance the continuity of essential healthcare services. Telemedicine also makes it feasible for local or international medical experts to give advice and support to local health workers over long distances; thus, improving healthcare quality and minimizing the effect caused by shortage of health workers.

Vaccination Campaigns

One of the key promoters of global polio eradication efforts is the increased penetration of mobile technology across almost 95% of the global population (7). The increased access to mobile technology has facilitated the application of mobile health (mHealth) in immunization campaigns; thus, increasing popular participation in vaccination activities. As observed, timely access to accurate information by people may greatly influence their decision to get vaccinated (7). One of the vital lessons learned from the polio vaccination campaigns is that establishing trust is critical to the success of any disease eradication campaign. Initially, one of the largest barriers to progress in the polio eradication efforts in Nigeria was the opposition and hesitancy against the polio vaccine from various households due to associated myths and socio-cultural barriers, especially in Northern Nigeria (8). Ultimately, mHealth was adopted as a tool to influence the acceptance of vaccines, build public confidence, and address popular vaccination misconceptions, which are widespread in most African countries (7). The discovery of the COVID-19 vaccine has prompted various countries worldwide to deploy telemedical technology that will be effective in safely acquiring, disseminating, and following up the vaccination process. For example, a particular method employed during the polio eradication campaign was the use of Geographical Information Systems (GIS) to track progress during vaccination, allowing areas with low vaccination coverage to be identified and addressed (7). This can also be applied by Nigerian telehealth experts to improve vaccination coverage. Additionally, the telemedical use of electronic medical records (EMR) can be employed as a method for recording data and monitoring people who have been vaccinated. This involves the design of an auto-

mated surveillance and reporting system that records any possible vaccine side effects and sends back signals to the vaccine surveillance team, enabling prompt response (9). This will help increase people's confidence about getting vaccinated.

Challenges and Recommendations

Telemedicine has proven to be an effective way of managing disease outbreaks and ensuring the availability of essential healthcare services, as it is cost-effective, facilitates early disease detection, increases accessibility of basic health education, and improves the management of diseases via teleconsultation. Although there are numerous prospects of telemedicine for providing the needed healthcare services to an ever-growing population, there are also several roadblocks to this achievement in Africa and Nigeria precisely such as low technological literacy, high cost of internet subscriptions, data privacy, inadequate power supply, misinformation, and cultural misconceptions. In this regard, there is a need for Nigeria to optimize the growth and expansion of telemedicine by addressing the necessary human, infrastructural, policy, and delivery challenges. This includes expanding and improving Nigeria's usage of technological tools in healthcare, such as mobile positioning data, phone and video conference calls, geographical information systems, and electronic medical records. Employing such technological tools requires adequate funding of the healthcare sector, as well as establishing partnerships between healthcare facilities and technological firms. Public policies capable of facilitating this process should be enacted and implemented by the Nigerian government and policymakers.

Strengthening healthcare systems has become a priority for most countries worldwide in order to efficiently tackle the frequent problems of infectious disease outbreaks. Indeed, investing in the application of telemedicine to the current health needs in Nigeria is an important milestone the government should strive to accomplish in order to strengthen Nigeria's epidemic preparedness and improve the overall delivery of healthcare services within the country.

Footnotes

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